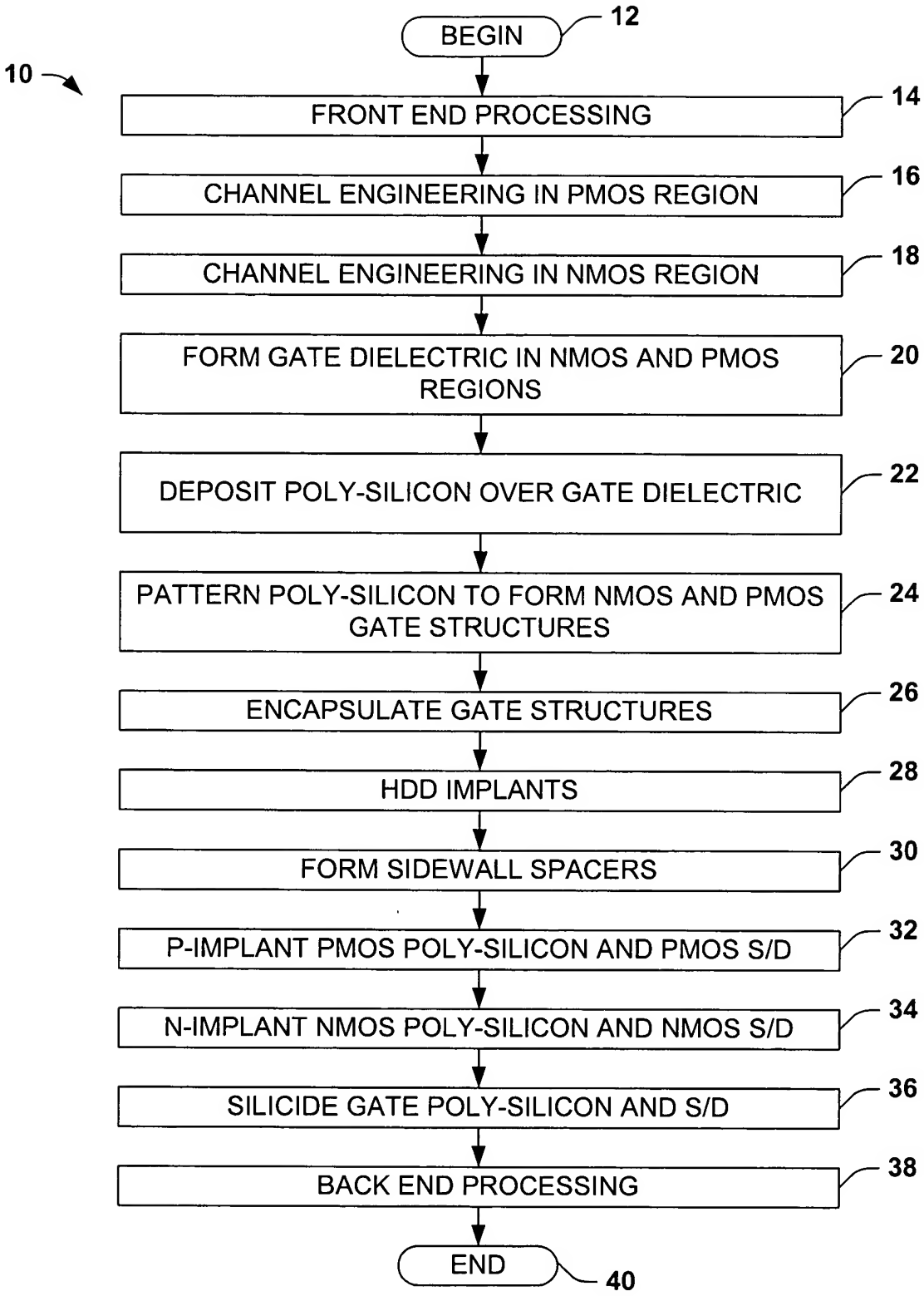

FIG. 1
(PRIOR ART)

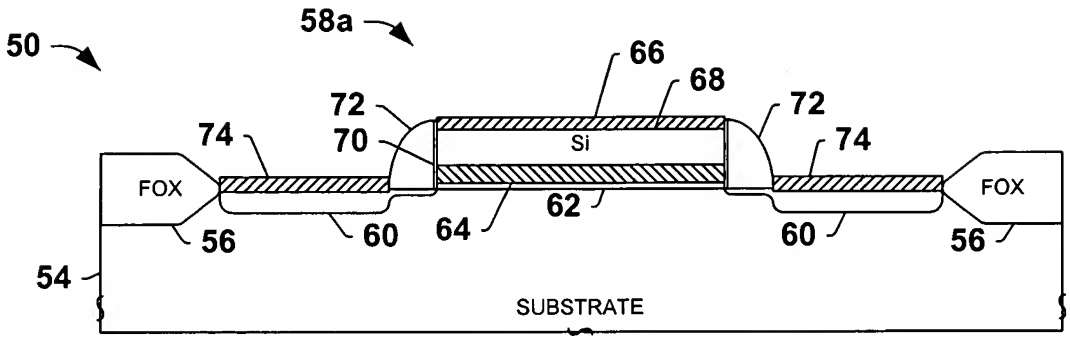
50
58a
66
68
72
72
74
70
Si
74
FOX
FOX
62
56
60
64
60
56
54
SUBSTRATE

FIG. 2A

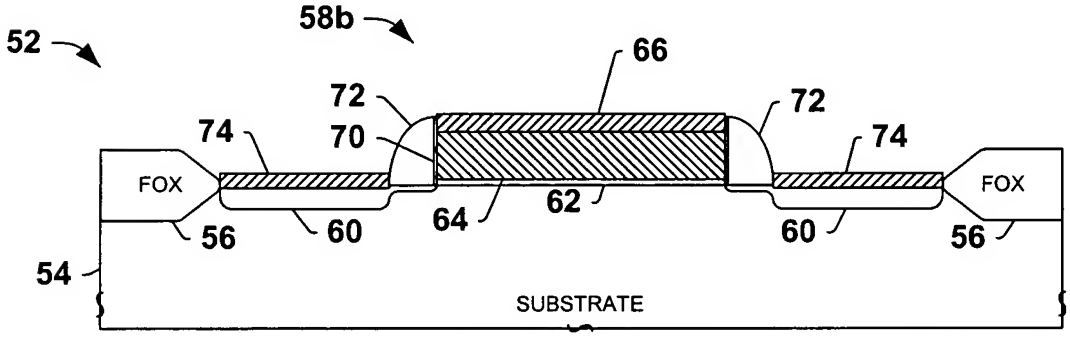
52
58b
66
72
72
74
70
74
FOX
FOX
62
56
60
64
60
56
54
SUBSTRATE

FIG. 2B

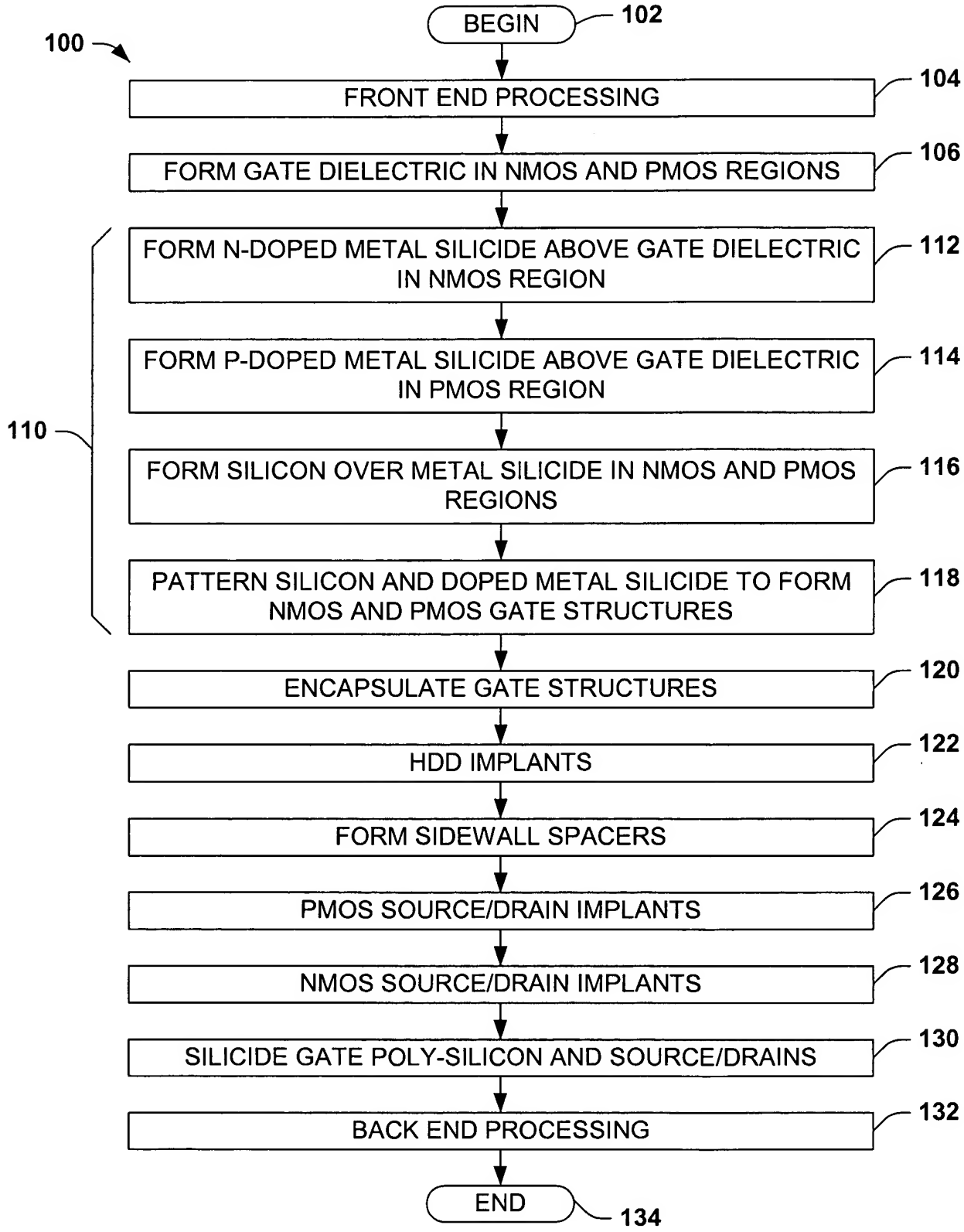
BEGIN
102
100
FRONT END PROCESSING
104
FORM GATE DIELECTRIC IN NMOS AND PMOS REGIONS
106
FORM N-DOPED METAL SILICIDE ABOVE GATE DIELECTRIC IN NMOS REGION
112
FORM P-DOPED METAL SILICIDE ABOVE GATE DIELECTRIC IN PMOS REGION
114
110
FORM SILICON OVER METAL SILICIDE IN NMOS AND PMOS REGIONS
116
PATTERN SILICON AND DOPED METAL SILICIDE TO FORM NMOS AND PMOS GATE STRUCTURES
118
ENCAPSULATE GATE STRUCTURES
120
HDD IMPLANTS
122
FORM SIDEWALL SPACERS
124
PMOS SOURCE/DRAIN IMPLANTS
126
NMOS SOURCE/DRAIN IMPLANTS
128
SILICIDE GATE POLY-SILICON AND SOURCE/DRAINS
130
BACK END PROCESSING
132
END
134

FIG. 3

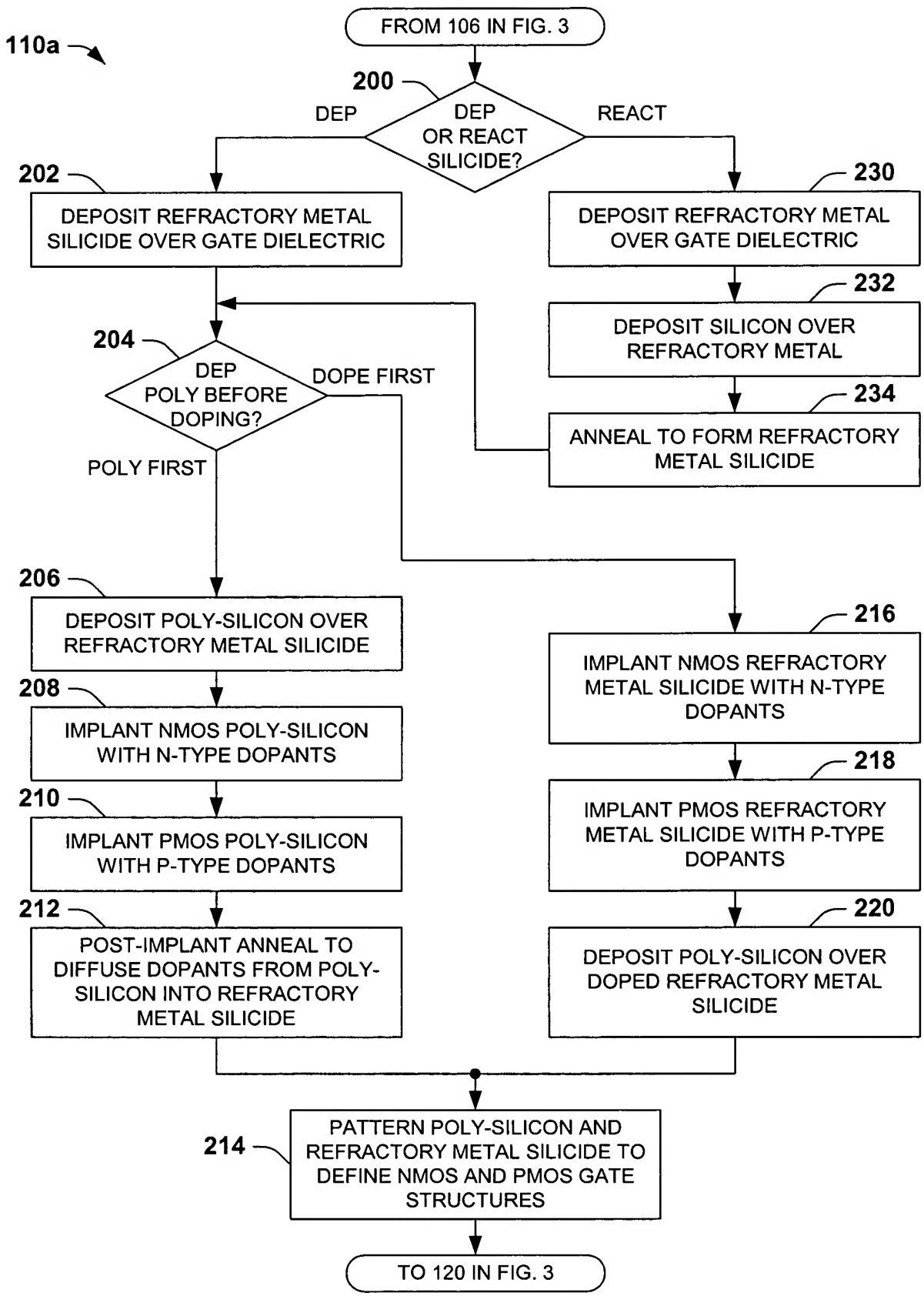
110a
FROM 106 IN FIG. 3
200
DEP OR REACT SILICIDE?
DEP
REACT
202
DEPOSIT REFRACTORY METAL SILICIDE OVER GATE DIELECTRIC
230
DEPOSIT REFRACTORY METAL OVER GATE DIELECTRIC
232
DEPOSIT SILICON OVER REFRACTORY METAL
234
ANNEAL TO FORM REFRACTORY METAL SILICIDE
204
DEP POLY BEFORE DOPING?
DOPE FIRST
POLY FIRST
206
DEPOSIT POLY-SILICON OVER REFRACTORY METAL SILICIDE
208
IMPLANT NMOS POLY-SILICON WITH N-TYPE DOPANTS
210
IMPLANT PMOS POLY-SILICON WITH P-TYPE DOPANTS
212
POST-IMPLANT ANNEAL TO DIFFUSE DOPANTS FROM POLY-SILICON INTO REFRACTORY METAL SILICIDE
216
IMPLANT NMOS REFRACTORY METAL SILICIDE WITH N-TYPE DOPANTS
218
IMPLANT PMOS REFRACTORY METAL SILICIDE WITH P-TYPE DOPANTS
220
DEPOSIT POLY-SILICON OVER DOPED REFRACTORY METAL SILICIDE
214
PATTERN POLY-SILICON AND REFRACTORY METAL SILICIDE TO DEFINE NMOS AND PMOS GATE STRUCTURES
TO 120 IN FIG. 3

FIG. 4

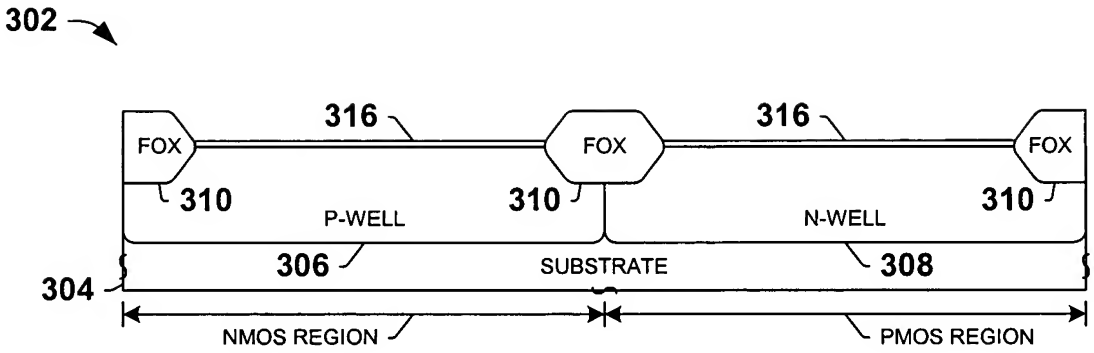

FIG. 5A

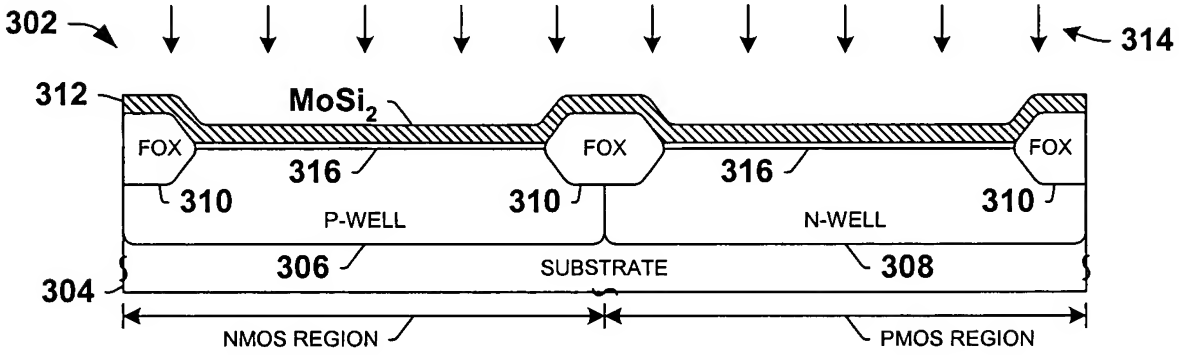

FIG. 5B

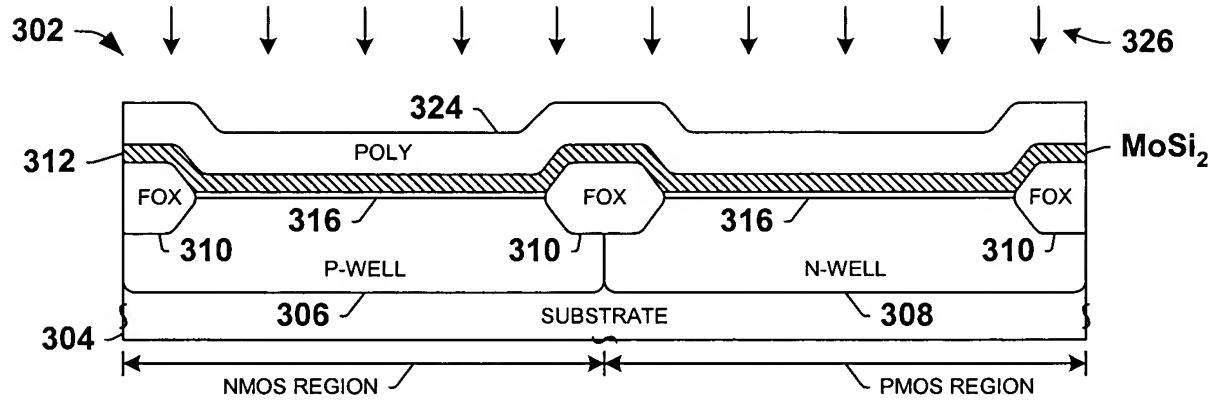

FIG. 5C

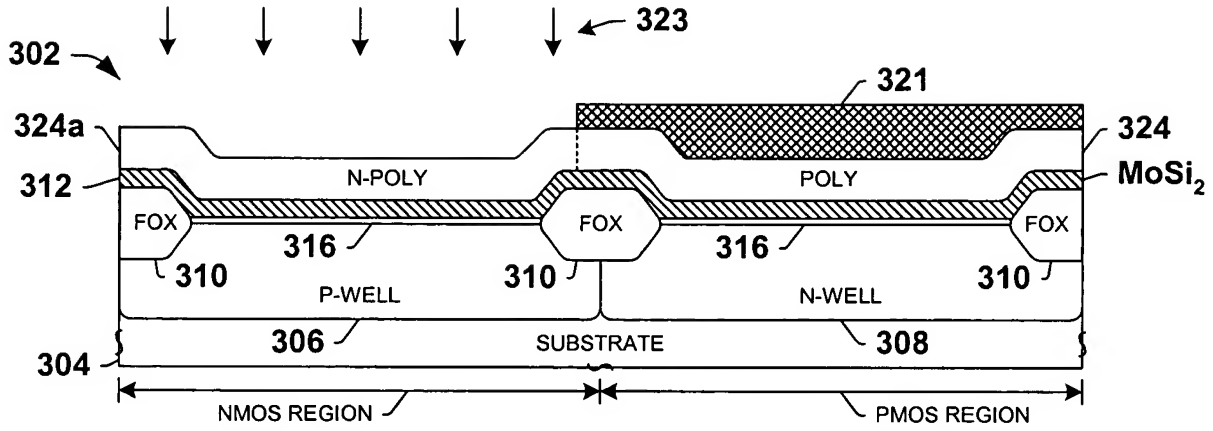

FIG. 5D

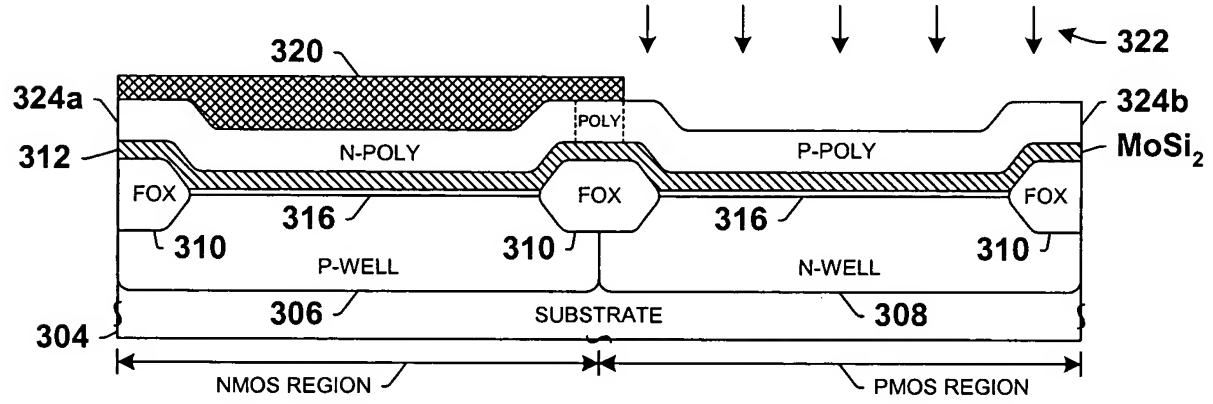

FIG. 5E

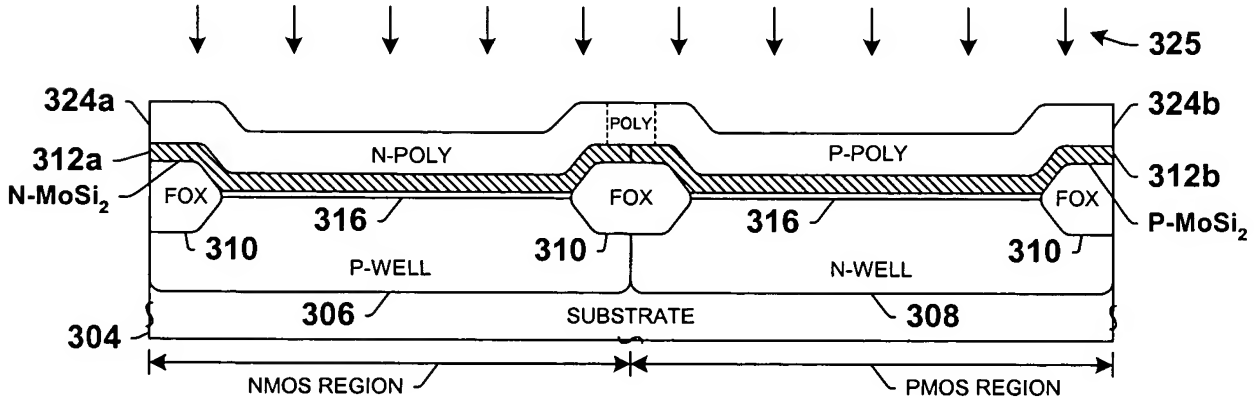

FIG. 5F

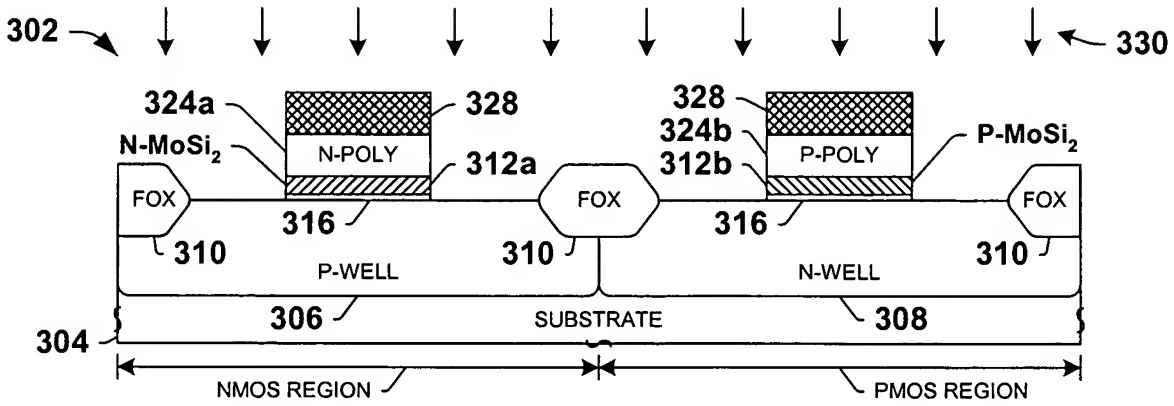

FIG. 5G

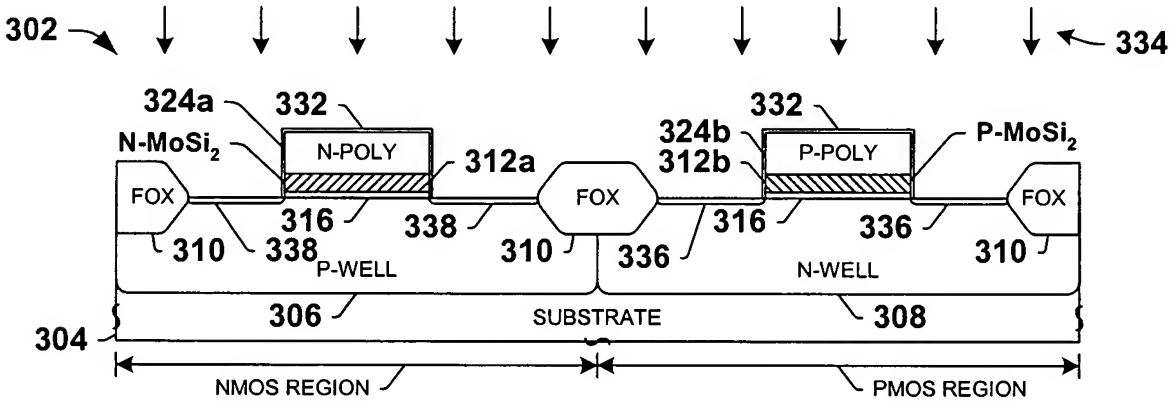

FIG. 5H

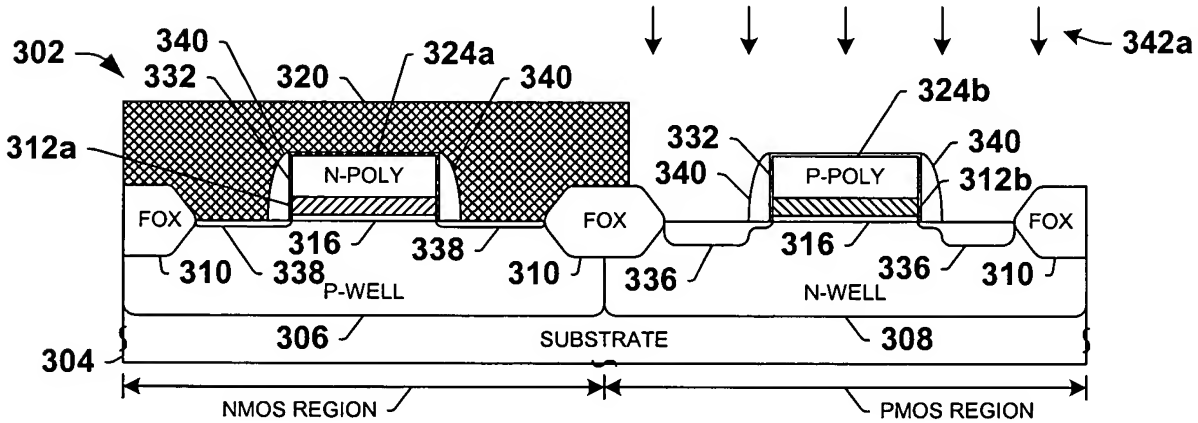

FIG. 5I

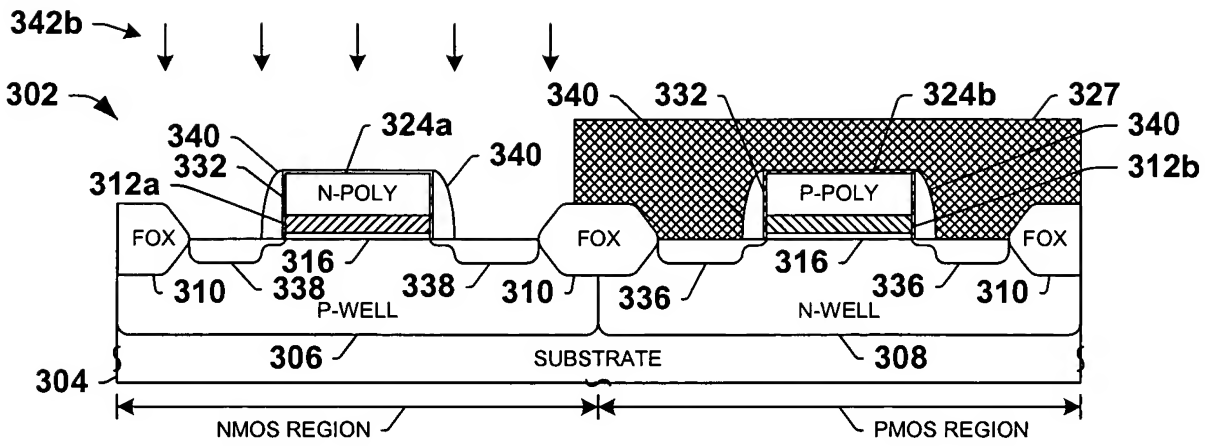

FIG. 5J

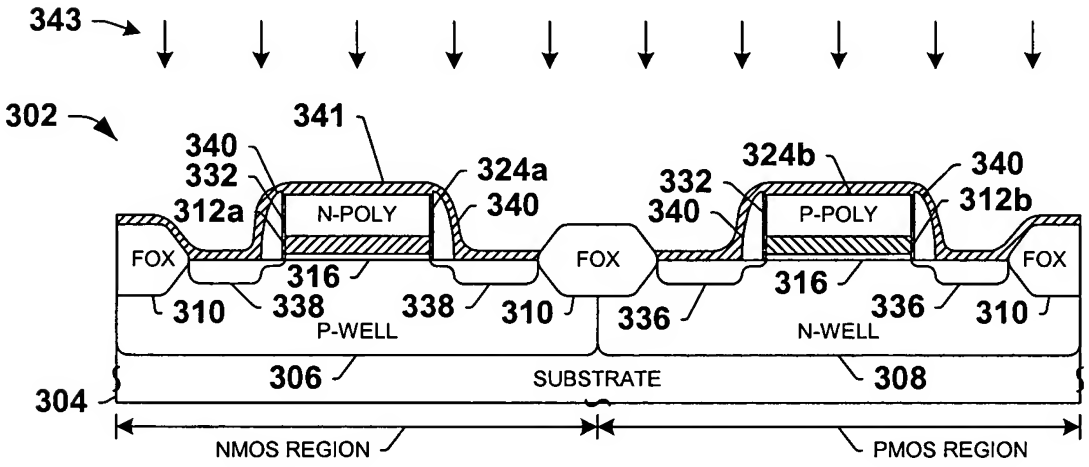

FIG. 5K

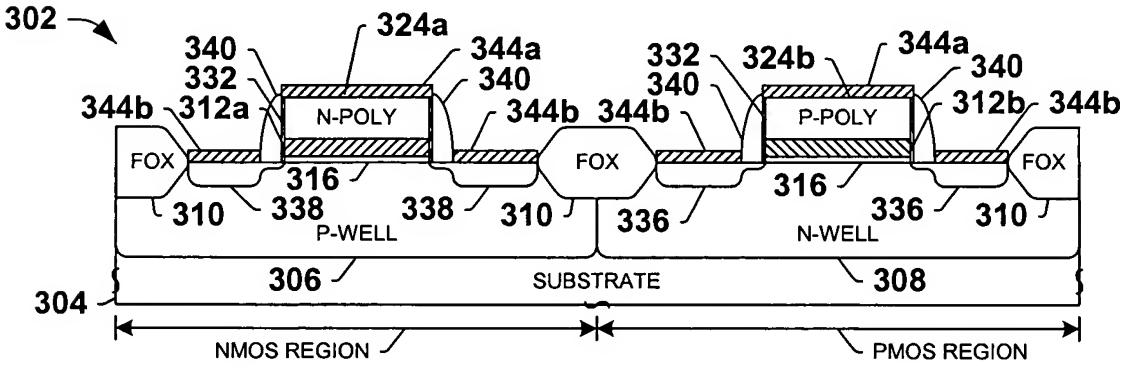

FIG. 5L

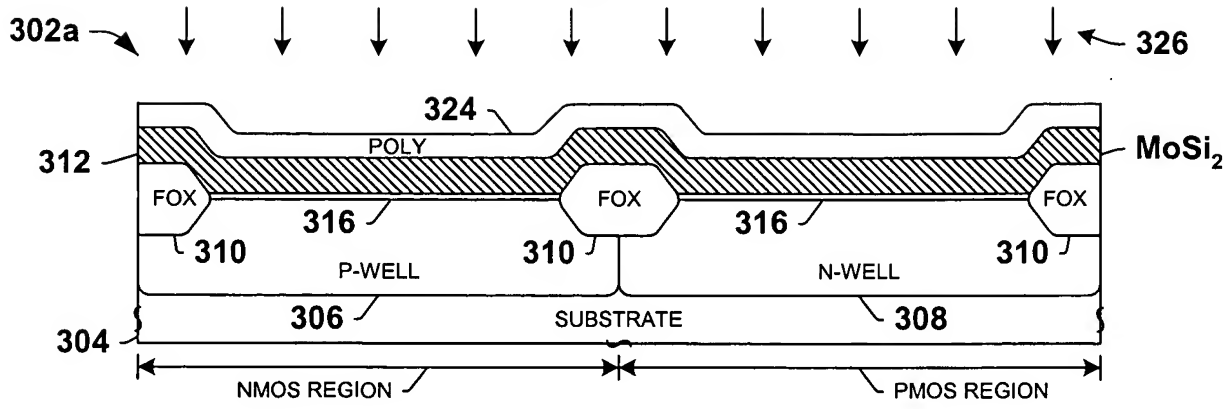

FIG. 5M

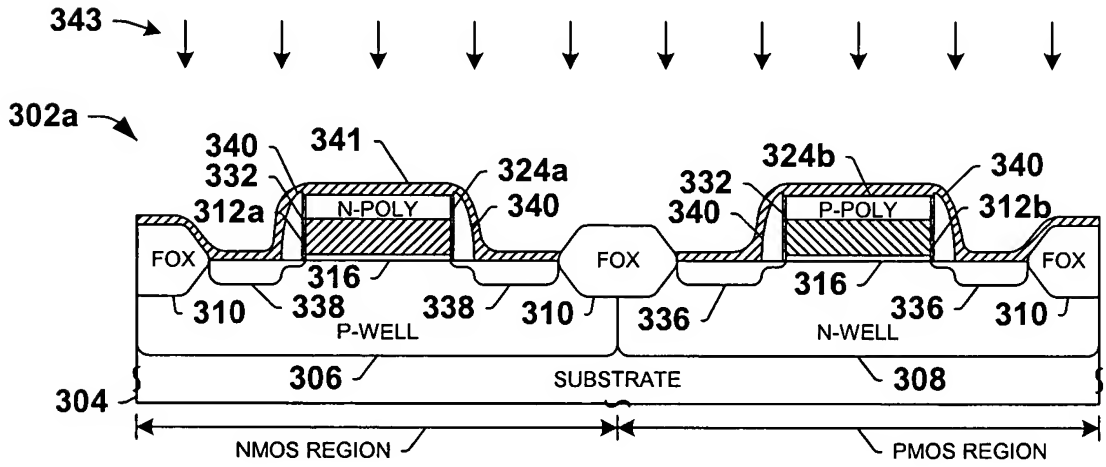

FIG. 5N

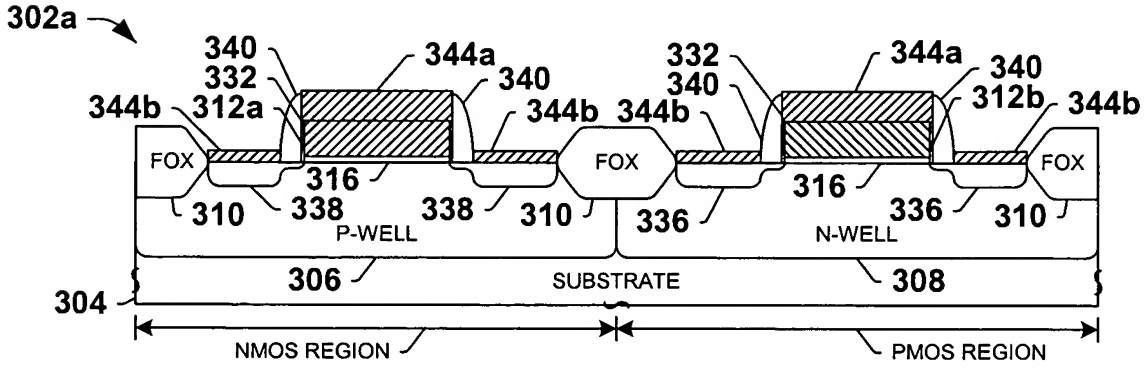

FIG. 5O

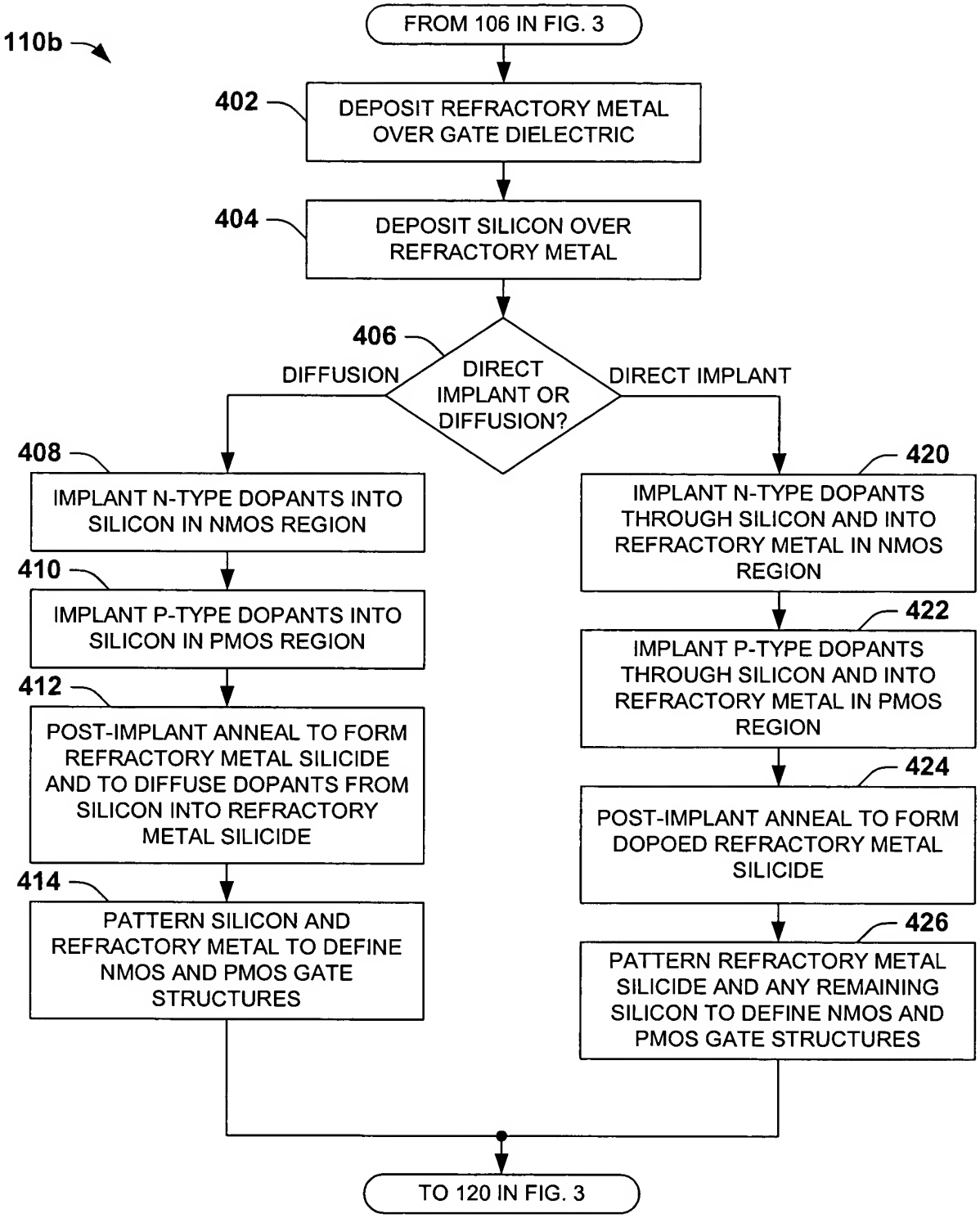
110b
FROM 106 IN FIG. 3
402
DEPOSIT REFRACTORY METAL OVER GATE DIELECTRIC
404
DEPOSIT SILICON OVER REFRACTORY METAL
406
DIRECT IMPLANT OR DIFFUSION?
DIFFUSION
DIRECT IMPLANT
408
IMPLANT N-TYPE DOPANTS INTO SILICON IN NMOS REGION
410
IMPLANT P-TYPE DOPANTS INTO SILICON IN PMOS REGION
412
POST-IMPLANT ANNEAL TO FORM REFRACTORY METAL SILICIDE AND TO DIFFUSE DOPANTS FROM SILICON INTO REFRACTORY METAL SILICIDE
414
PATTERN SILICON AND REFRACTORY METAL TO DEFINE NMOS AND PMOS GATE STRUCTURES
420
IMPLANT N-TYPE DOPANTS THROUGH SILICON AND INTO REFRACTORY METAL IN NMOS REGION
422
IMPLANT P-TYPE DOPANTS THROUGH SILICON AND INTO REFRACTORY METAL IN PMOS REGION
424
POST-IMPLANT ANNEAL TO FORM DOPOED REFRACTORY METAL SILICIDE
426
PATTERN REFRACTORY METAL SILICIDE AND ANY REMAINING SILICON TO DEFINE NMOS AND PMOS GATE STRUCTURES
TO 120 IN FIG. 3

FIG. 6

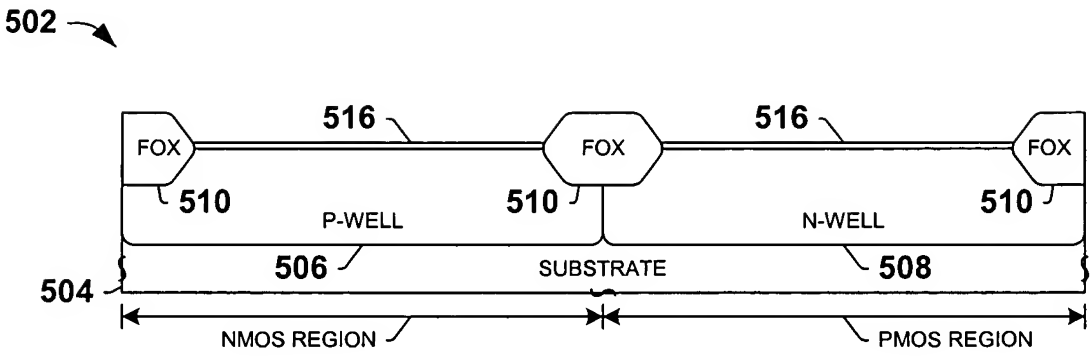

FIG. 7A

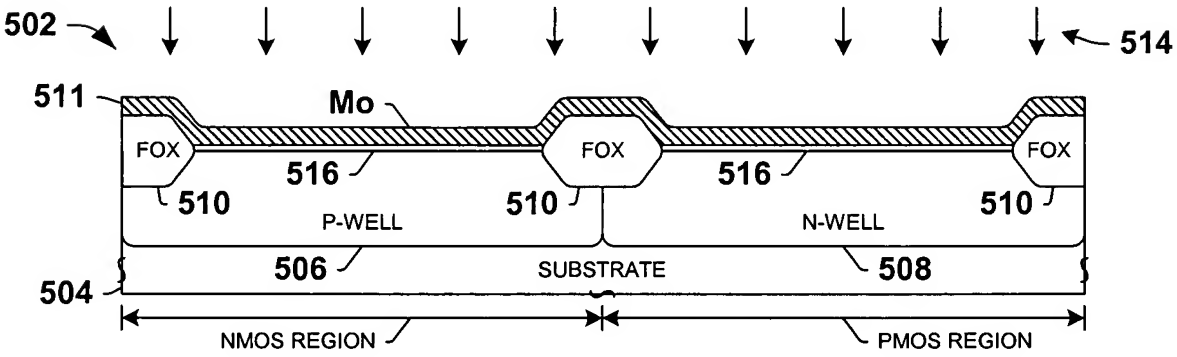

FIG. 7B

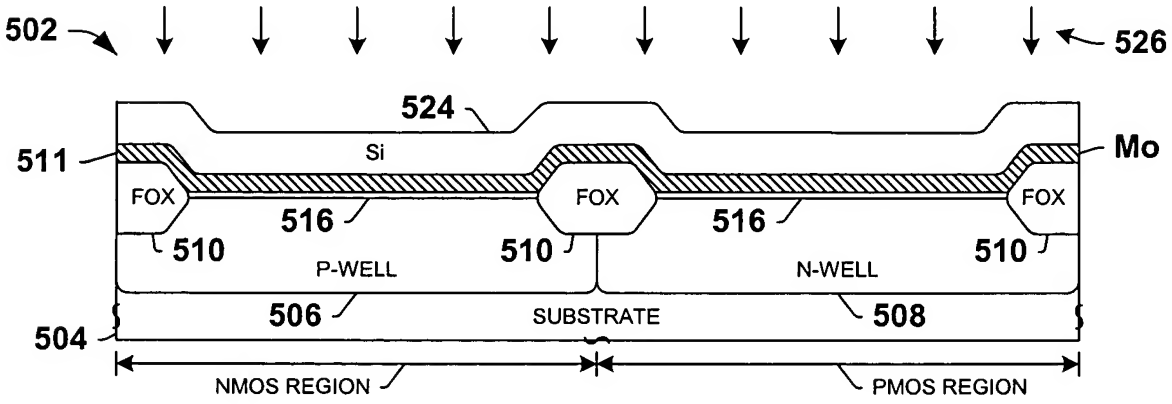

FIG. 7C

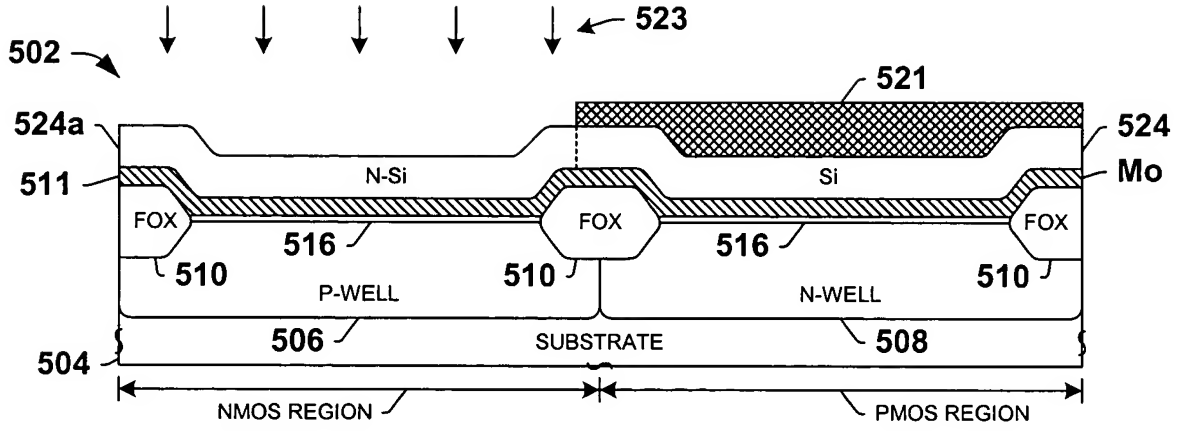

FIG. 7D

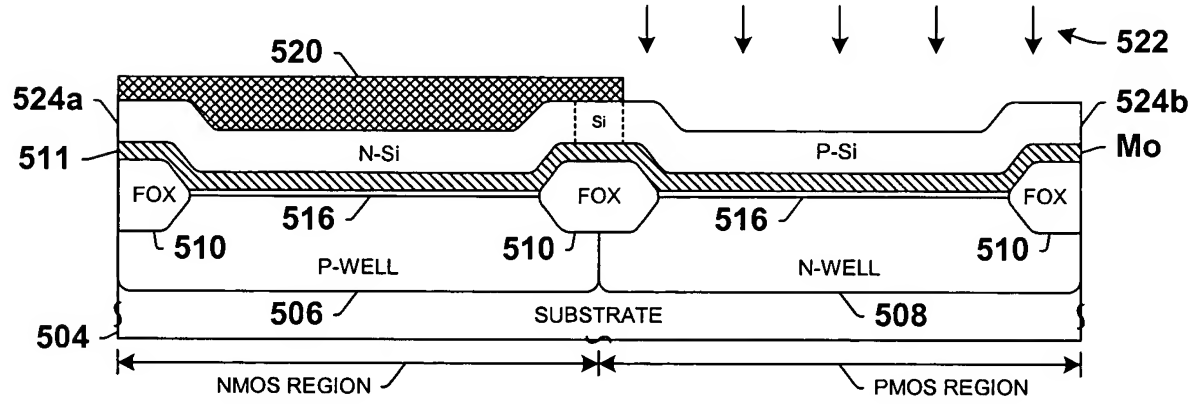

FIG. 7E

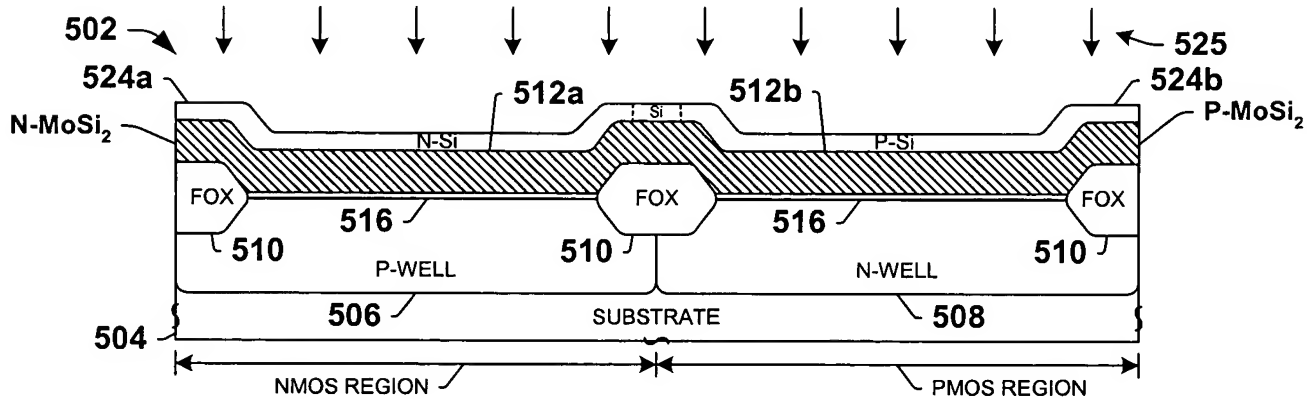

FIG. 7F

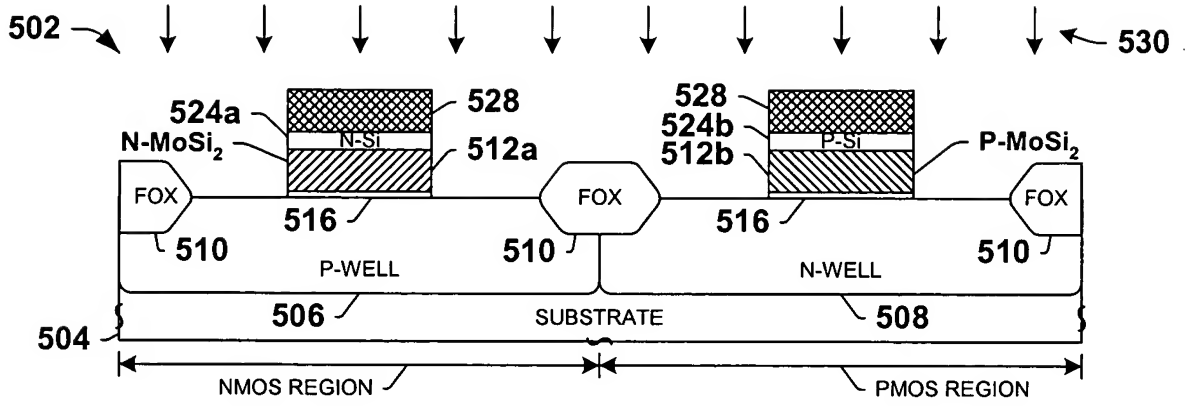

FIG. 7G

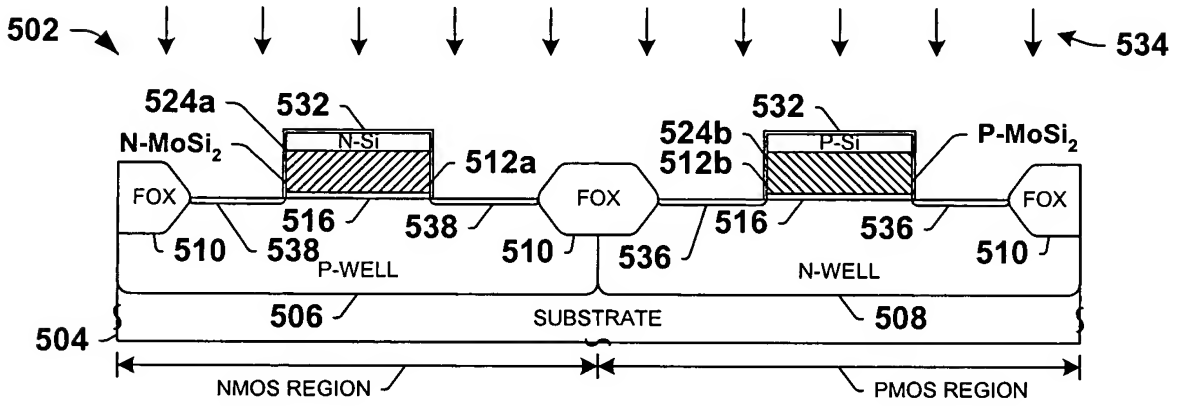

FIG. 7H

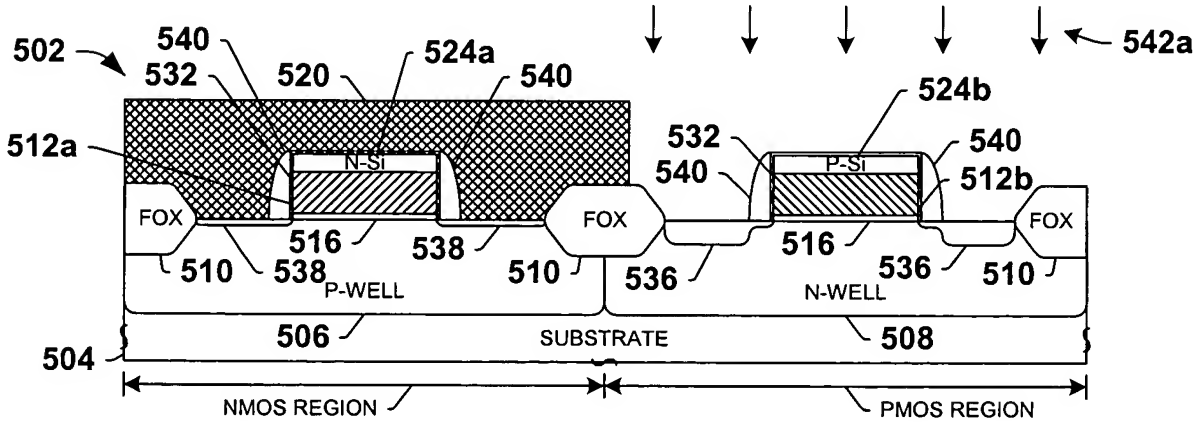

FIG. 7I

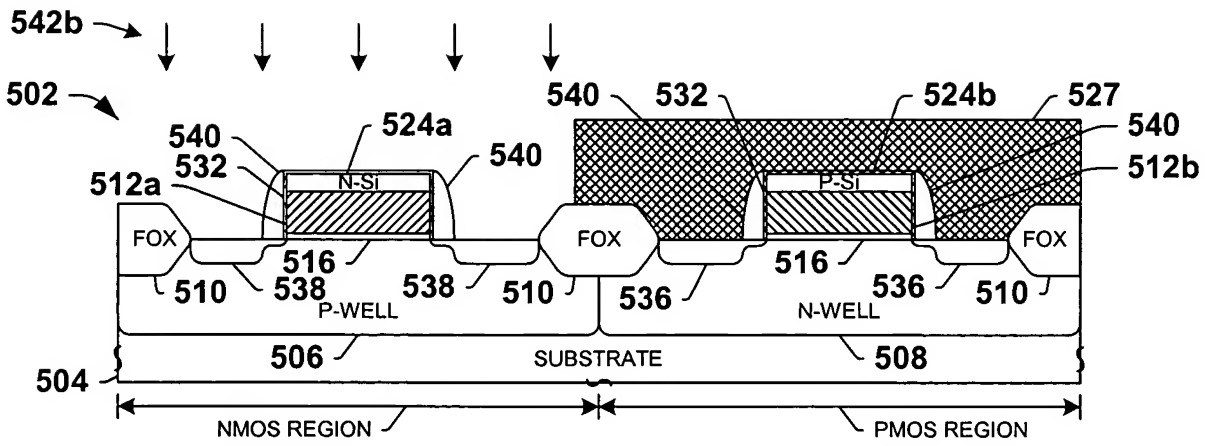

FIG. 7J

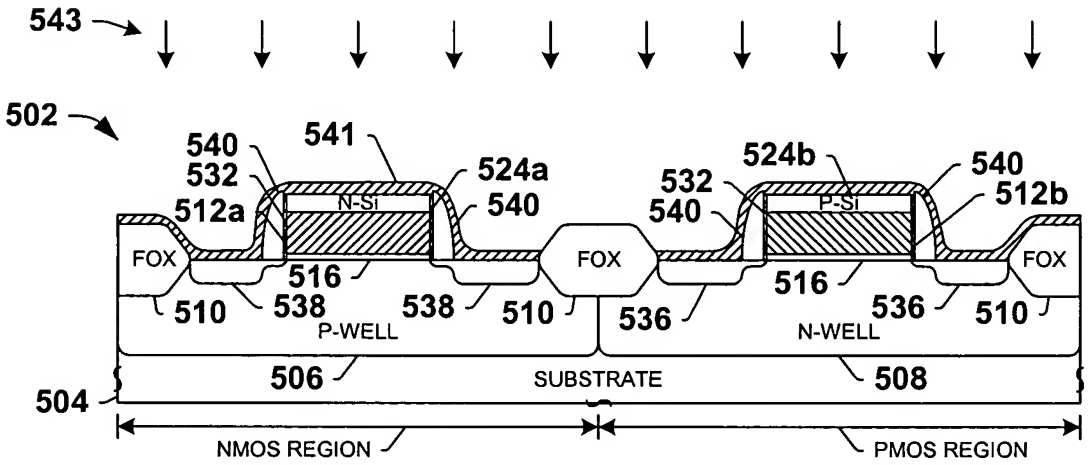

FIG. 7K

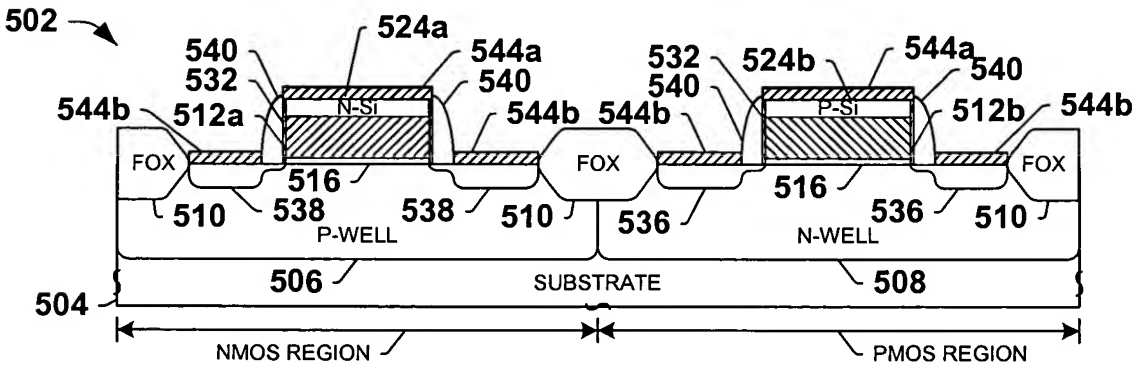

FIG. 7L

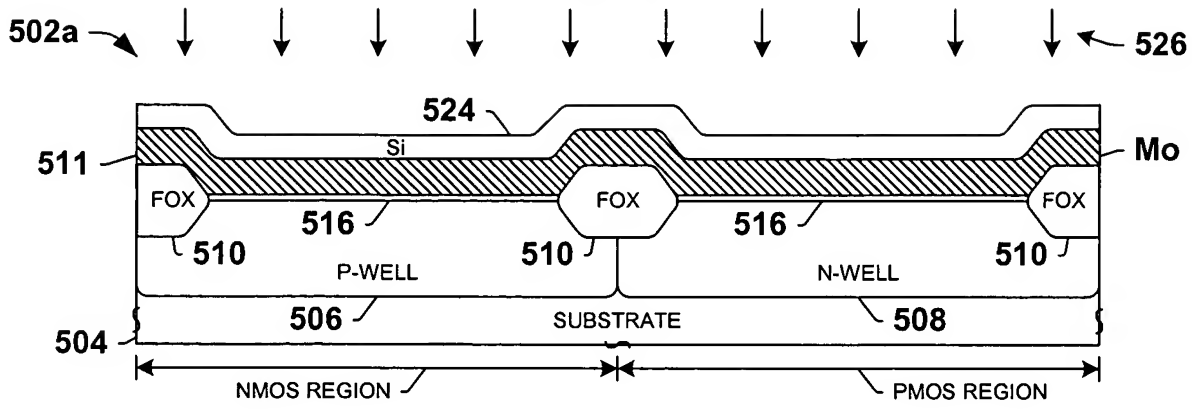

FIG. 7M

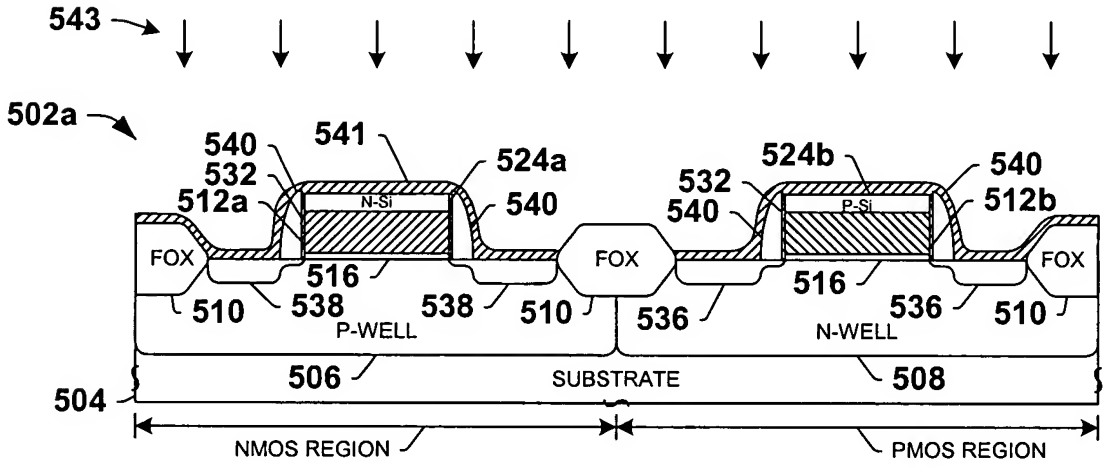

FIG. 7N

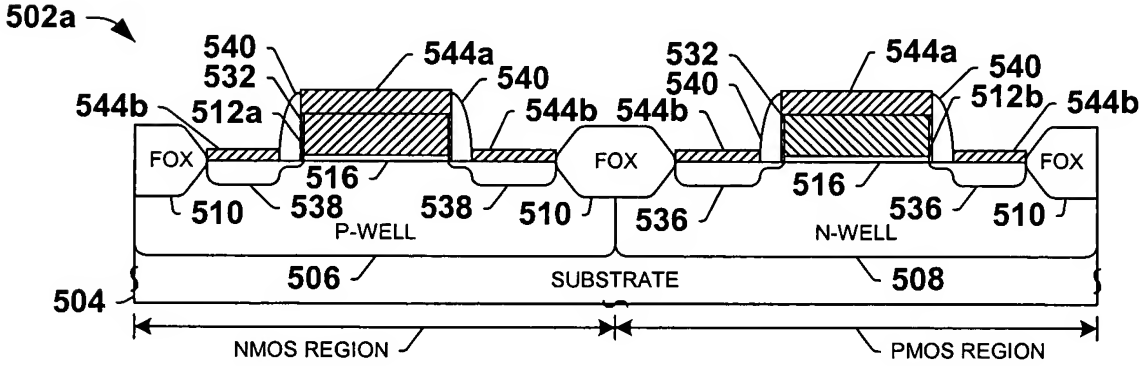

FIG. 7O